Serial No. 09/455,932 Docket No. 1341.1035

1. (currently amended) A relaying apparatus for use in a network system, the network system including a plurality of client terminals and server terminals providing services to those client terminals via a network, the relaying apparatus comprising:

a plurality of route load measuring units each provided in, or in the vicinity of, each of said server terminals and each measuring a respective load in a route from the route load measuring unit to one client terminal having issued a request for service out of said client terminals; and

a selecting unit which selects one server terminal out of said server terminals as a destination of the request for service from said one client terminal based on the load measured by said route load measuring units,

wherein said route load measuring units each measures, as the load, an effective bandwidth of the route, the effective bandwidth estimated based on a plurality of parameters, wherein the parameters include at least a round-trip time, a maximum segment size, and an average congestion window size.

2. (previously presented) The relaying apparatus for use in a network system according to Claim 1, further comprising a storing unit which stores the load measured at a pre-specified time interval by each of said route load measuring units, and wherein

when a request for service is received from said one client terminal, said selecting unit selects said one server terminal out of said server terminals as a destination of the request for service from said one client terminal based on the load stored in the storing unit.

3. (previously presented) The relaying apparatus for use in a network system according to Claim 2, wherein each of said route load measuring units monitors operating states of respective server terminal and

when a request for service is received from said one client terminal, said selecting unit selects one server terminal out of said server terminals as a destination of the request for service from said one client terminal based on the load and the operating states monitored by said load measuring units.

4. (currently amended) A relaying apparatus for use in a network system, the network system including a plurality of client terminals and server terminals that are divided into several groups each having at least two of the server terminals and that provide services to those client terminals via a network, the relaying apparatus comprising:

a plurality of route load measuring units in, or in the vicinity of, each of said server terminals, each provided with respect to each of the groups and each measuring a respective load in a route from the route load measuring unit to one client terminal having issued a request for service out of said client terminals; and

a selecting unit which selects one route load measuring unit out of said route load measuring units as a primary destination of the request for service from said one client terminal based on the load measured by said route load measuring units, wherein

said one route load measuring unit selects one server terminal out of the server terminals in the group as a secondary destination of the request for service from said one client terminal, and

said route load measuring units each measures, as the load, an effective bandwidth of the route, the effective bandwidth estimated based on a plurality of parameters, wherein the parameters include at least a round-trip time, a maximum segment size, and an average congestion window size.

5. (previously presented) The relaying apparatus for use in a network system according to Claim 4, wherein each said route load measuring units monitors operating states of the respective server terminals in the group, and said one route load measuring unit selects one server terminal out of the server terminals in the group based on the operating states when selecting the secondary destination.

6. (currently amended) A relaying apparatus for use in a network system, the network system including a plurality of client terminals and server terminals that are divided into several groups each having at least two of the server terminals and that provide services to those client terminals via a network, the relaying apparatus comprising:

a plurality of route load measuring units in, or in the vicinity of, each of said server terminals, each provided with respect to each of the groups, each measuring a respective load in a route from the route load measuring unit to one client terminal having issued a request for service out of said client terminals and monitoring operating states of said server terminals in each group; and

a selecting unit which selects one route load measuring units out of said route load measuring units as a primary destination of the request for service from said one client terminal based on the load measured and the operating states monitored by said route load measuring units, wherein

said one route load measuring unit selects based on the operating states one server terminal out of the several server terminals in the group as a secondary destination of the request for service from said one client terminal and

said route load measuring units each measures, as the ~~the~~ load, an effective bandwidth of the route, the effective bandwidth estimated based on a plurality of parameters, wherein the parameters include at least a round-trip time, a maximum segment size, and an average congestion window size.

7. (currently amended) A relaying apparatus for use in a network system, which network system is formed with a plurality of client terminals and server terminals providing services to the client terminals via a network, comprising:

a plurality of path load measuring and operating state monitoring devices in, or in the vicinity of, each of said server terminals, arranged to measure effective bandwidths of path loads from a client terminal requesting service to server terminals wherein the effective bandwidth is based on a plurality of parameters and wherein the parameters include at least a round-trip time, a maximum segment size, and an average congestion window size and to monitor operating states of server terminals; and

a DNS-responding device to compare effective bandwidths of measurements of path loads from the plurality of path load measuring and operating state monitoring devices to the client terminal and to select a server terminal having a largest effective bandwidth and an active operating state to provide service to the client terminal.

8. (currently amended) A relaying apparatus for use in a network system, which network system is formed with a plurality of client terminals and server terminals providing services to the client terminals via a network, comprising:

a plurality of path load measuring and operating state monitoring devices in, or in the vicinity of, each of said server terminals, arranged to measure, as loads in paths from a client terminal requesting service to server terminals, effective bandwidths of the paths wherein the effective bandwidth is based on a plurality of parameters and wherein the parameters include at least a round-trip time, a maximum segment size, and an average congestion window size and to monitor operating states of server terminals; and

a DNS-responding device to compare the effective bandwidths measured by the path load measuring and operating state monitoring devices and to select a server terminal having a largest effective bandwidth and an active operating state to provide service to the client terminal.

Joffe relates to a system of assigning a request for a data object form a client to one of multiple network servers, based on a particular routing policy. The policy includes minimizing the amount of time for the request to be completed by, for example, serving the data object to the client according to the shortest available network path (see lines 4 to 8 on page 5). The shortest available network path is selected based on the server status such as the load (the number of currently open TCP connections, free RAM, free SWAP, and CPU idle time) of the srever terminal measured by a load manager 366 of the server and on the network path characteristics such as an ICMP echo response time measured by the ping manager 364 of the client (see lines 14 to 16 on page 17, and lines 1 to 18 on page 18).

In contrast, according to the present invention, the destination of the request for service is selected based on the load in the route from the route load measuring unit to the client terminal, the load measured by the route load measuring unit that is in the server terminal or in the vicinity of the server terminal. The load in the route is the effective bandwidth of the route, the effective bandwidth estimated based on a plurality of parameters. More specifically, the parameters include at least a round-trip time, a maximum segment size, and an average congestion window size (A). The present invention provides great advantages, for example, in an environment in which services are provided to any unspecified multiple users via a network where the systems of the users cannot be changed, because the load in the route can be measured at the server side (or in the vicinity of the server) without having to provide any special means in the user terminals.

Therefore, Joffe fails to disclose that the route load measuring units are provided in the server terminal or in the vicinity of the server terminal, as disclosed by the present application. Further, Joffe fails to disclose measuring anything related to the effective bandwidth of the present invention. That is, according to Joffe, the load manager 365 in the server measures the load in the server terminal instead of the load in the path. Moreover, according to Joffe, the ping manager 364 of the client measures "round trip values" (see line 10 of page 20) which may correspond to one of the parameters determining the effective bandwidth in the present invention, but the ping manager 364 is not in the server terminal not in the vicinity of the server terminal, and the ping manager 364 does not measure the effective bandwidth based on a plurality of parameters as recited in the independent claims 1, 4 and 6.